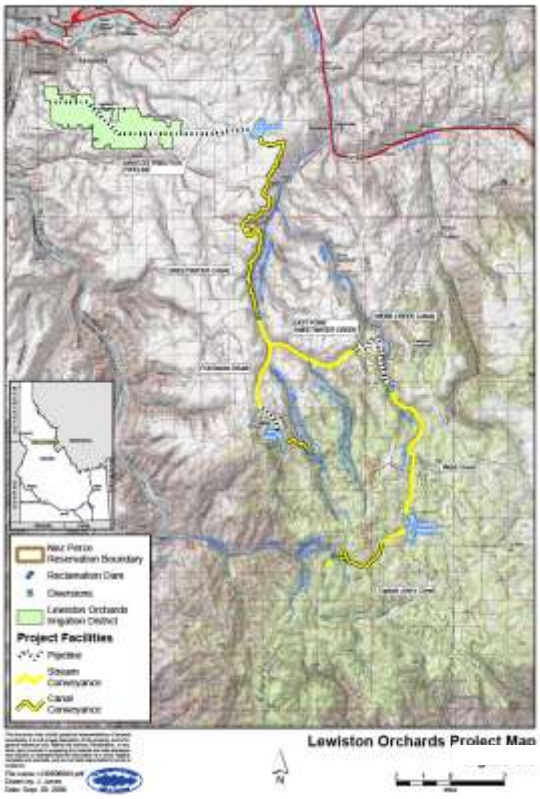
RECLAMATION

Managing Water in the West

Lower Clearwater Exchange Project Appraisal Report

Rural Water Supply Program
Snake River Area Office, Pacific Northwest Region



U.S. Department of the Interior
Snake River Area Office
Pacific Northwest Region
Bureau of Reclamation
Boise, Idaho

December 29, 2011

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Lower Clearwater Exchange Project Appraisal Report

Rural Water Supply Program
Snake River Area Office, Pacific Northwest Region

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Acronyms and Abbreviations

C.F.R.	Code of Federal Regulations
CPC	Clearwater Power Company
ESA	Endangered Species Act
FOA	Funding Opportunity Announcement
LCEP	Lower Clearwater Exchange Project
LOID	Lewiston Orchards Irrigation District
LOP	Lewiston Orchards Project
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OM&R	operation, maintenance, and replacement
P&Gs	Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, Water Resources Council, March 10, 1983
pp.	pages
Reclamation	Bureau of Reclamation
RWSP	Rural Water Supply Program
Rule	Rural Water Supply Program interim final rule, 43 CFR 404

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Addendum: Lower Clearwater Exchange Project Appraisal Study, September 2011

Introduction and Background

About this Appraisal Report

Rural Water Supply Program

The Bureau of Reclamation's (Reclamation) Rural Water Supply Program (RWSP) addresses rural water needs in the Reclamation States. Reclamation's Snake River Area Office, the Pacific Northwest Region, and the Technical Service Center prepared this Appraisal Report pursuant to the Reclamation Rural Water Supply Act of 2006 (43. U.S.C. §§ 2401-2409 (Supp. 2011) and Appraisal Criteria promulgated by the Secretary included in Reclamation's Rural Water Supply Program interim final rule (43 C.F.R. Part 404) (Rule) (Code of Federal Regulations, 2008).

Purpose of the Appraisal Report

The Appraisal Study entitled *Lower Clearwater Exchange Project Appraisal Study* is proposed for consideration under Reclamation's Rural Water Supply Act by the Lower Clearwater Exchange Project (LCEP) stakeholder group. The stakeholder group is comprised of the Lewiston Orchards Irrigation District (LOID) acting as the RWSP Appraisal Study sponsor, the Nez Perce Tribe (Tribe), the City of Lewiston, Idaho (City), Nez Perce County, Idaho (County), and the Lewis Clark Valley Chamber of Commerce (the Chamber).

The Appraisal Report is Reclamation's first step in determining whether at least one viable alternative warrants a more detailed investigation through a Feasibility Study or to terminate Reclamation's involvement in the LCEP investigation. This Appraisal Report was developed by Reclamation to determine whether it is appropriate to proceed to a Feasibility Study as described in the Reclamation Rural Water Supply Act of 2006 under 43 C.F.R. §§ 404.44-45. This determination is based on information contained in the LCEP's Appraisal Study, provided as an Addendum to this Appraisal Report.

The LCEP concept builds upon an idea that apparently originated in the 1970s. It was initiated by the stakeholder group to resolve water supply, Endangered Species Act (ESA), and Indian Trust Asset issues. The Nez Perce Tribe sued Reclamation and the National Oceanic and Atmospheric Administration (NOAA) Fisheries based on the alleged effects of the LOP on listed and endangered species (*Nez Perce Tribe v. NOAA Fisheries and United States Bureau of Reclamation*, No. CV-10-00286 (D. Idaho). Reclamation made a commitment to advance the study and investigation of the ongoing LCEP as a potential comprehensive solution to Lewiston Orchard Project (LOP) issues, at the suggestion of

Commissioner Connor (Reclamation March 26, 2010) and as part of a stay agreement in effect until December 31, 2013.

The LOID, on behalf of the LCEP stakeholder group, was awarded financial assistance in 2010 through Reclamation's RWSP to conduct an Appraisal Study of the LCEP concept with Reclamation through a cooperative agreement.

Appraisal Report Authority

This Appraisal Report was conducted under the authority of the Reclamation Rural Water Supply Act of 2006 (P.L. 109-451).

Appraisal Report Contents

This Appraisal Report provides a determination of the project's eligibility for the Rural Water Supply Program under criteria established in 43 C.F.R. §§ 404.2, 6, 7 "Additional Required Content for Feasibility Studies" as described in Section IV.C of the 2010 Funding Opportunity Announcement (FOA) No. R11SF80307 are also addressed as part of this Appraisal Report.

Appraisal Study Sponsors

The Appraisal Study sponsor is LOID, acting on behalf of the LCEP stakeholder group. LOID is a dual water purveyor with authority under Idaho law to provide water delivery service. In 1906, a private company constructed initial facilities which delivered irrigation and domestic water to the bench above Lewiston, Idaho. Facilities were expanded in the following decade. In 1922, the LOID formed and constructed additional improvements. By the 1940s, LOID facilities were in disrepair and LOID requested assistance from the Federal government. Subsequently, the LOP was authorized on July 31, 1946 (P.L. 79-569) for construction, operation, and maintenance of the project for irrigation, municipal, and incidental purposes. A contractual relationship was established in 1947.

The LOP area lies in the southern portion of the City of Lewiston, within Nez Perce County. The District serves about 60 percent of the residents of Lewiston, or a population of about 18,500 inhabitants (Addendum, page 27).

LOID's services include delivery of water for domestic, municipal, industrial, commercial, and non-commercial irrigation use. The LOID service area is enclosed by two service boundaries: the irrigation boundary defined by the LOP and subject to Federal law, and the domestic boundary, a private endeavor not subject to Federal law. The LOP irrigation service area acreage is fixed. Water provided by the LOP is currently used for irrigation of landscaping and non-commercial agricultural irrigation (Addendum, page 4). The LOP was authorized for, and did initially provide, domestic water supply to LOP patrons. However, domestic supply is now provided from groundwater through a system of deep wells developed by LOID independent of the LOP (Reclamation 2010a). The domestic service boundary is thus not subject to restrictions by Reclamation and

may be altered by the LOID Board. At this time, the irrigation and domestic service boundaries are similar; however, the domestic service boundary continues to expand (Addendum, page 27).

The LOP service area was annexed in 1969 by the City of Lewiston, and the annexation resulted in two separate domestic water systems within the City (Addendum, page 27). The City also is a water purveyor with authority under Idaho law to provide water delivery service.

The LOP's facilities and features lie predominantly within the Lapwai Creek Basin, a tributary to the Clearwater River. The small Captain John Diversion and Canal are within the Snake River Basin. The confluence of the Clearwater and Snake rivers has historically provided a comfortable setting for humans to hunt, fish, and later, harvest crops and lumber. Some of the LOP facilities are located within the Nez Perce Indian Reservation boundaries, most notably, Reservoir A (known locally as Mann Lake). The LOP collects drainage from the Craig Mountain watersheds and alters the stream hydrology in Webb, Sweetwater, and Lapwai creeks. These streams run through the Nez Perce Reservation and are part of the treaty fisheries areas of the Tribe (Reclamation 2010b).

The Snake River salmon and steelhead are significant Tribal cultural resources and Indian Trust Assets. The Lapwai Creek drainage has historically been used for cultural and spiritual activities. The Nez Perce Tribe has been working throughout the Pacific Northwest to promote recovery of these listed species, and is currently a co-manager, along with the state and Federal agencies, of the fisheries resources in the Columbia and Snake River basins (Reclamation 2010b). The LCEP Appraisal Study area is part of that action area.

Appraisal Study Location and Description

The Appraisal Study area is bounded by the Snake River to the west, Clearwater River to the north, Captain John Creek to the south, and the Lapwai Creek watershed to the east (Addendum, page 21). Figure 1 provides a vicinity map of the area.

In general, the Appraisal Study area has two distinctly different portions: Lewiston, which contains the LOP service area, and the Craig Mountain watershed, which provides the source for LOP water. These differences are based on elevation, topography, land characteristics, and population.

The Lewiston portion is generally located at the confluence of the Clearwater and Snake rivers. Current populations of the City and Nez Perce County are approximately 33,000 and 40,000 residents, respectively. The populated area typically consists of flat, plateau type landforms. Lewiston is one of the oldest cities in the region. Due to its history, water and natural landforms have heavily influenced development patterns. The Snake River has always been a major

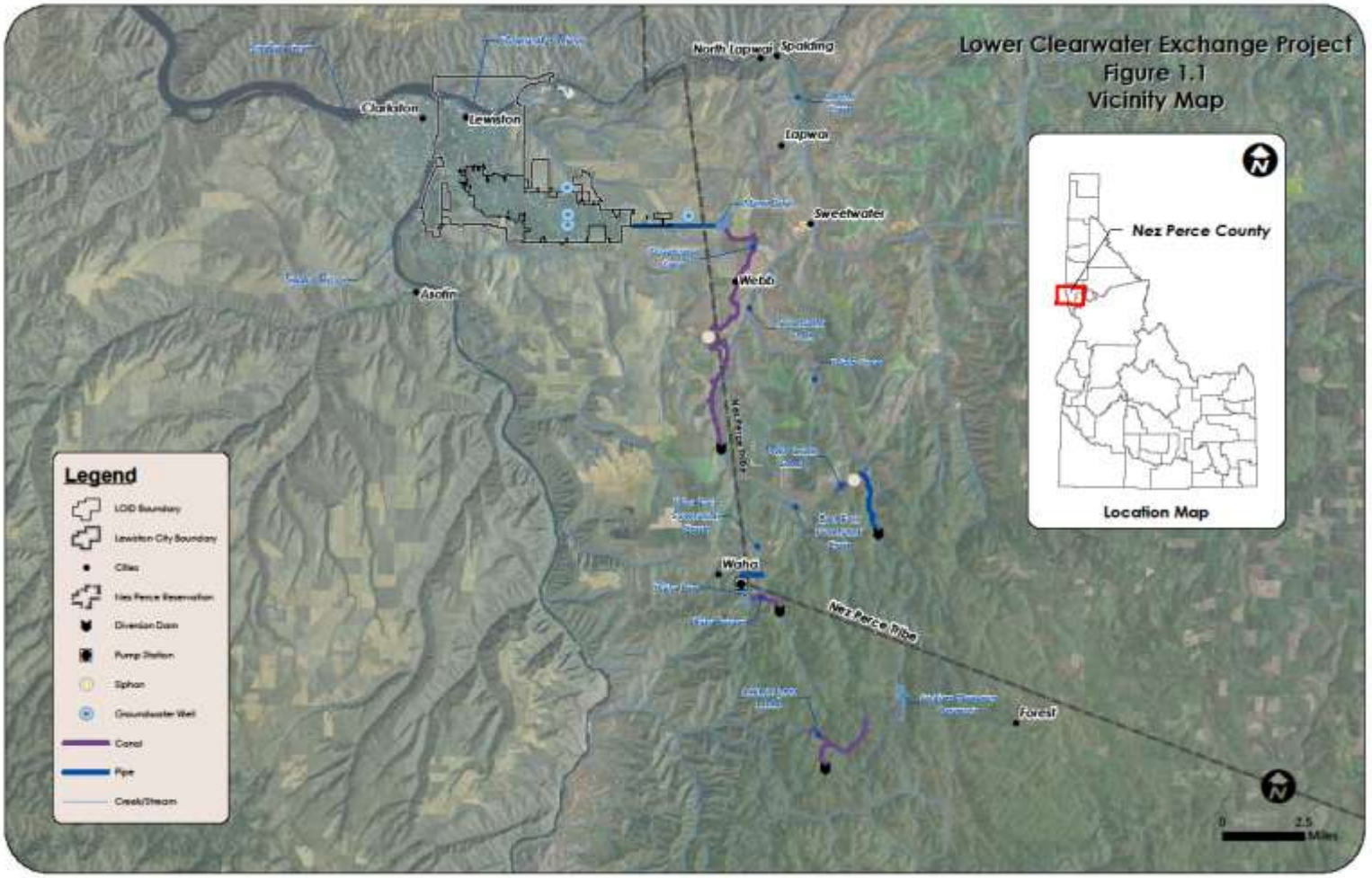

Figure 1. Vicinity Map (Addendum, Figure 1.1)

transportation corridor in the area, providing linkage between the Inland Northwest and the Pacific Ocean via the Columbia River. A series of canals constructed in 1896 and 1915 initially allowed navigation between the Columbia and Snake rivers. Navigation to Lewiston was improved between 1961 and 1975 with construction of the Lower Snake River Project and a series of four dams by the U.S. Army Corps of Engineers that earned Lewiston its distinction as Idaho's only seaport. Lewiston has retained its historic character as the central market place of north central Idaho (Addendum, page 21).

The LOP service area comprises much of the south-southeast portion of the City of Lewiston. When originally developed in 1906, the service area of the LOP consisted primarily of orchards. Now, residential areas have expanded so that more than 76 percent of the land within the LOP service area is in ownership parcels of less than 2 acres, with parcels averaging 0.55 acre in size. The remaining 24 percent of land is in ownerships averaging less than 5 acres. Subdivision is expected to continue (Reclamation 2010a). Figure 2 provides a map of the LOP service area.

The Craig Mountain watershed area is south of Lewiston, forming the headwaters of Lapwai Creek and is located at the northern end of the Hells Canyon region. Highly dissected canyons are dominated by grassland slopes containing a mosaic of shrub field, riparian, and woodland habitats. The Craig Mountain area is sparsely populated (Addendum, page 21).

The LCEP concept was initiated by the stakeholder group to resolve water supply, ESA, and Indian Trust Asset issues. The action alternatives provide for alternate sources of water with adequate supply for current and future needs as identified by the LCEP stakeholder group. The action alternatives free up Lapwai Creek water for tributary instream flow increases to address the ESA and Indian Trust Asset issues, and stop LOP operations on the Nez Perce Reservation also to address Indian Trust Asset issues.

The Appraisal Study action alternatives address the LOID water supply issue. The LCEP stakeholder group identified elements of the ESA and Indian Trust Asset issues as risks, uncertainties, and unresolved issues (Addendum, page 69).

Description of the Alternatives

The LCEP stakeholder group established broad screening criteria in addition to the three objectives upon which the LCEP concept was founded. An array of alternatives was screened, and four sets of alternatives were developed.

- Future-Without-the-Project
- Clearwater River Pump Station Attenuated System (three options)
- Snake River Pump Station Attenuated System (two options)
- Tammany Well Field Attenuated System (one option)

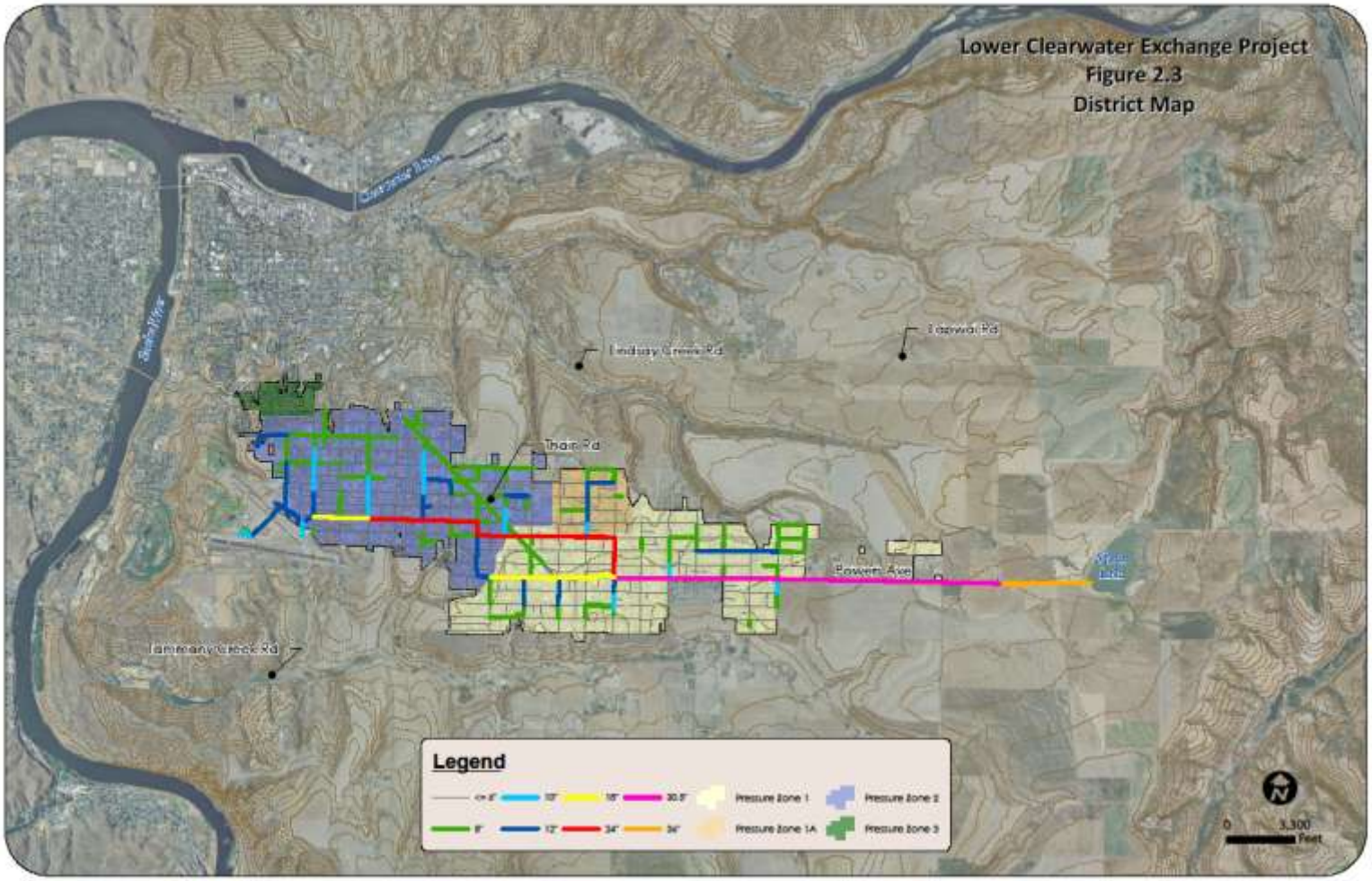

Figure 2. LOP Boundaries (Addendum, Figure 2.3)

Common design criteria were used for all of the developed alternatives, as summarized here (Addendum pp. 64-67).

Service Area – All of the developed alternatives provide water to the same parcels and acreage. The LOP service boundary is static and not subject to growth. Growth outside the LOP service boundary was assumed by the LCEP stakeholder group to be served by a separate domestic system.
Annual Water Supply – The annual water supply value used by the LCEP stakeholder group is 8,500 acre-feet. This quantity was selected because it approximates, on a gross LOP acreage basis, the 2.2 acre-feet per acre water delivery entitlement established under the existing 1947 agreement between Reclamation and LOID. Design delivery is calculated by fitting the monthly consumptive use curve to an annual delivery volume of 8,500 acre-feet.
Reservoir A Storage – Each of the identified alternatives continues to utilize Reservoir A to provide operational water storage. Although the reservoir has a total capacity of 3,000 acre-feet, Reclamation's Safety of Dams program enacted restrictions which reduced the reservoir's total storage capacity to 1,960 acre-feet at elevation 1,800 feet. While Reclamation conditionally increased the operating level in 2009, the LCEP stakeholder group's analysis assumes the total storage capacity of the reservoir is 1,960 acre-feet.
Fire Storage – The District is obligated under an agreement with the City of Lewiston to reserve 500 acre-feet of water stored in Reservoir A for fire suppression purposes. Leaving the fire storage at its current level and assuming a reservoir capacity of 1,960 acre-feet results in an operational capacity of 1,460 acre-feet.
Evaporation and Seepage - Several attempts to document seepage in Reservoir A have been completed during various studies. An estimated value of 500 acre-feet is used by the LCEP stakeholder group.

Reclamation's role and the disposition of LOP facilities in these alternatives have yet to be fully defined.

Future-Without-the-Project –Alternative A
The Future-Without-the-Project alternative is the most reasonable prediction of what would happen in the project area if no actions were taken. The Future-Without provides the basis to which the other alternatives are compared.

Under this alternative, the existing facility configuration would remain in place and operations are assumed to be maintained in approximately the same manner. Reclamation and LOID would continue in their respective roles. Roles associated with operational requirements and project costs may evolve.

The LOP as currently configured is able to meet the instream flow requirements of the 2010 Biological Opinion as well as deliver the highest reliably recorded water year demands in an average or better water year. In a letter dated August 20, 2004, Reclamation indicated the average volume of water delivered to LOID

for the previous 12 years was 1.4 acre-feet per acre, or 5,373 acre-feet (Reclamation 2010b). Current LOP conveyance system limitations include, but are not limited to, elevation restrictions on Reservoir A and Sweetwater Creek and Canal capacity limitations. These limitations may preclude delivery of a full 8,500 acre-feet annually by the LOP.

LOID conservation practices consist of watering restrictions during dry years. Metering activities continue and may result in future decisions by the LOID Board to revisit pricing structures.

Project costs for the 2007-2010 period were approximately $500,000 annually for Reclamation and $250,000 for LOID, totaling approximately $750,000 annually (all quoted costs are present value). Annual electrical costs (associated primarily with pumping from Lake Waha) are paid by LOID and are approximately $19,000 (Addendum, Appendix K, Table 3). Reclamation's costs are projected to decrease substantially after 2013. It is reasonable to assume that litigation which is currently stayed, pending this planning process, would be resumed without future Federal action. No estimated costs associated with litigation or settlement are currently available from any party who might be associated with future litigation or settlement agreements.

The United States currently holds the water rights for the LOP. The water rights have been partially decreed in the Snake River Basin Adjudication. A portion of the water right have been and would continue to be leased yearly to the Idaho Water Resource Board pursuant to the Idaho State Water Bank, to meet instream targets of the Biological Opinion for the LOP.

Clearwater River Alternatives – Alternatives B, B1, and C

Under each of these three alternatives, a pump station would be located on the southern bank of the Clearwater River which would provide water to LOID, operating year-round to refill Reservoir A storage, in lieu of the current source. This concept has received attention in numerous studies dating back to 1972. Water intake screens would address impacts to both anadromous and resident fish.

The Clearwater pump station would be served by Clearwater Power Company (CPC), a non-profit electrical cooperative located near the site. The proposed site is located across the river from CPC's Spalding sub-station, and a river crossing would be required to provide electrical service. The sub-station is sufficiently sized to serve the Clearwater pump station (Addendum, pp 72-87).

Water rights would be appropriated from the State of Idaho for use by LOID. This reach of the Clearwater River is not overappropriated, and it is not anticipated there would be a problem acquiring water rights on this reach of the river. The current water rights would be transferred for use by the Tribe or leased through the Idaho State Water Bank.

The sponsor holds title to any planned facilities and is responsible for 100 percent of the OM&R costs for any rural water facility that is planned, designed, and recommended under the RWSP.

Reclamation's role is expected to evolve but has not yet been fully defined.

The Clearwater alternatives include three preliminary system connection scenarios based on various pipe route options:

Alternative B, Reservoir A Discharge: Water would be supplied from the Clearwater to Reservoir A in a single lift via a pipe route located mostly, but not entirely, within County right-of-way. This action alternative does not provide equivalent service (pressure) as all other action alternatives, because the size of the existing Powers Avenue main limits flows to the LOID distribution and delivery system. Estimated infrastructure capital costs are $18.7M with estimated OM&R costs of $680,000 annually, of which $597,000 is estimated to be electrical costs.

Alternative B1, Reservoir A Discharge with Powers Avenue Upgrade: Water would be supplied from the Clearwater to Reservoir A in a single lift via a pipe route located mostly, but not entirely, within County right-of-way. The distribution pipe along Powers Avenue to 16th Street would be upgraded with a new, parallel pipe to provide equivalent service as other action alternatives that connect directly to the distribution system. Estimated infrastructure capital costs are $21.3M with estimated OM&R costs of $687,000 annually, of which $590,000 is estimated to be electrical costs.

Alternative C, Distribution System Discharge: Water would be supplied from the Clearwater in a single lift directly to the distribution system via a pipe route located mostly, but not entirely, within County right-of-way. Reservoir A would be used for storage and would be filled by pumping water back through existing piping on Powers Avenue. Connection to the existing distribution system provides a new supply point near the center of the distribution system and appears to resolve some existing pressure and capacity issues. Estimated infrastructure capital costs are $19.2M with estimated OM&R costs of $681,000 annually, of which $590,000 is estimated to be electrical costs.

Snake River Alternatives – Alternatives D and E

Under these alternatives, a pump station would be located on the eastern bank of the Snake River to provide water to LOID, which would operate year-round to refill Reservoir A storage, in lieu of the current source. Intake screens would address both anadromous and resident fish. Both options discharge to the existing

distribution system at the same point as the Clearwater River Distribution System Discharge alternative and provide similar operational parameters.

The pump station would be served by Avista Power Company (Avista), a for-profit electrical company regulated by the Idaho Public Utilities Commission. Avista has power lines in the area with adequate capacity to serve the Snake River alternatives (Addendum, pp 87-99).

Water rights for both Snake River alternatives would be appropriated from the State of Idaho for use by LOID. This reach of the Snake River is not overappropriated and it is not anticipated there would be a problem acquiring water rights on this reach of the river. The current water rights would be transferred for use by the Tribe or leased through the Idaho State Water Bank.

The sponsor holds title to any planned facilities and is responsible for 100 percent of the OM&R costs for any rural water facility that is planned, designed, and recommended under the RWSP.

Reclamation's role is expected to evolve but has not yet been fully defined.

These options differ due to routing, as follows:

Alternative D, Southport Avenue: Water would be supplied from the Snake River to the distribution system. This pipe route alignment provides the most direct and shortest route. A significant portion of the pipe could be installed in public right-of-way. Estimated infrastructure capital costs are $17.1M with estimated OM&R costs of $873,000 annually, of which $794,000 is estimated to be electrical costs.

Alternative E, Tammany Creek Road: Water would be supplied from the Snake River to the distribution system in a single lift. The pipe route alignment is longer than the Southport Avenue routing. It follows Tammany Creek and remains at low elevations for much of its length. The option was selected for review due to the potential to install piping completely within existing public right-of-way. Estimated infrastructure capital costs are $23.1M with estimated OM&R costs of $915,000 annually, of which $824,000 is estimated to be electrical costs.

Tammany Well Field – Alternative F

The Tammany Well Field alternative was developed because it provides a potential water supply that is closer to the LOID service area, thereby reducing the length of pipe required, eliminating in-river work and the need for intake screens, and avoiding culturally and/or biologically sensitive areas along the rivers. A well field sited along Tammany Creek Road was selected because of the proximity to the LOID area and potential to penetrate the Lewiston Basin regional

aquifer. The well field site is relatively distant from other large production wells and is located at a relatively low elevation, which provides shallower static water levels, reduced well depths, and more pump options.

The proposed pipe alignment follows portions of the Snake River Action Alternative alignments. Permitting of this option is expected to be less complex than for the river alternatives. The well field would connect to the existing distribution system and provide a new supply near the center of the distribution system. The system would operate year-round, refilling Reservoir A for storage. Six wells were selected to provide a similar level of reliability to river pump stations that contained six pumps. Estimated infrastructure capital costs are $27.9M with estimated OM&R costs of $960,000 annually, of which $831,000 is estimated to be electrical costs.

Power for the well field would be provided by Avista. Avista has indicated that while they have power lines in the area, some rebuilding of the lines would be required to provide the capacity required for the well pumps (Addendum, pp 100-109).

Groundwater rights would be appropriated from the State of Idaho for use by LOID under this alternative. It is not anticipated there would be a problem acquiring water rights associated with the Lewiston Basin regional aquifer. The current water rights would be transferred or leased through the Idaho State Water Bank. Long term protection of the aquifer under a Lewiston-Clarkston area growth scenario is unknown, but there is apparently a hydraulic connection between the aquifer and the Snake River. Construction and operation of this alternative to serve a static demand of 8,500 acre-feet would likely cause a water level decline of less than 30 feet (Addendum, Appendix E, page 17).

Under the RWSP, the sponsor holds title to any planned facilities and is responsible for 100 percent of the OM&R costs for any rural water facility that is planned, designed, and recommended under the RWSP.

Reclamation's role is expected to evolve but has not yet been fully defined.

LCEP Stakeholder Groups alternative preference

Generally, the Clearwater River alternatives are most preferred by the LCEP stakeholder group. The Tammany Creek Road Snake River alternative is less preferred by the LCEP stakeholder group of the two Snake River alternatives due to cost. The Tammany well field alternative, while highest in cost using the estimated capacity provided, provides unique flexibility with potentially lower environmental and cultural impacts (Addendum, page 152).

Rural Water Eligibility

Sponsor and Project Eligibility

LOID, the non-federal project sponsor, acting on behalf of the LCEP stakeholder group, has state water delivery authority and is thus eligible for the Rural Water Program under 43 C.F.R. § 404.6. Under Idaho state law, two other stakeholder group members, the Nez Perce Tribe and City of Lewiston, are also eligible entities.

The project is eligible under Rule § 404.7. The proposed project is located in a Reclamation state and meets the definition of a Rural Water Supply Project set forth in 43 C.F.R. § 404.2.

Program Priorities

This project addresses the priorities as outlined in Rule § 404.13 and the 2011 FOA, Section V.A, as shown by the statements of the LCEP stakeholder group, in the *Lower Clearwater Exchange Project Appraisal Study*, as described in Table 1.

This project also fits into the priorities of P.L. 111-11, Subtitle F (also known as the Secure Water Act) Section 9504, by addressing a water-related conflict that has a nexus to a Federal reclamation project located in a service area.

Reclamation's Findings

This section summarizes Reclamation's findings on how the proposed project meets each of the requirements of Rule § 404.44. Reclamation found that the items required under the Rule and FOA were addressed in the LCEP stakeholder group's Appraisal Study and that it was technically sufficient.

Project Objective, Purpose, and Need

Reclamation finds the purpose statement provided by the LCEP stakeholder group adequate. Reclamation believes the 2010 Biological Opinion and associated proposed action meet the requirements of the ESA. In support of the term sheet agreement, Reclamation committed within its statutory authorities to:

- advance the study of the LCEP concept,
- collaborate in good faith in the ongoing Appraisal Study of the LCEP concept under the RWSP,
- exercise its discretion to assist with and expedite the completion of any Feasibility Study application for the RWSP,
- continue preliminary work on NEPA and title transfer at the earliest opportunity and as funding allows, and

- collaborate with the Tribe and LCEP partners to identify matching fund opportunities.

Need

The terms of Reclamation's 1947 repayment contract entitle each assessable acre of land in the LOP to an irrigation water supply not to exceed 2.2 acre-feet per acre measured at the point of delivery to each operating unit. All active capacity of the LOP storage facilities is contracted to LOID. The value of 8,500 acre-feet approximates the entitlement on a gross LOP acreage basis.

Functional water withdrawal from Sweetwater, Webb, and Captain John Creeks by LOID is restricted by physical limitations of the LOID system and water availability. In 2004 and 2005, LOID voluntarily provided some surface flows at the Sweetwater Diversion for ecosystem use by ESA-listed Class B steelhead. After 2006, operations were altered to include minimum flows. Minimum flows were increased under the 2010 Biological Opinion. Under the terms of the current term sheet agreement, an additional 90 acre-feet of water are to be made available annually in 2011, 2012, and 2013 to the natural system under the direction of the Nez Perce Tribe.

Each of the proposed alternatives would allow LOID to improve water delivery, quality, and service for its patrons, effectively addressing the District's existing rural water supply needs as well as providing the potential to serve projected Appraisal Study LOP-area non-commercial irrigation growth needs over the project's planning horizon. The LCEP stakeholder group states that by replacing the existing LOP, ESA and Federal/Tribal Trust issues would be effectively addressed by all of the proposed alternatives.

For the study area, existing Columbia Basin-level climate change modeling would need to be calibrated and climate change projections evaluated for results specific to the Clearwater watershed. This modeling effort was not performed for this Appraisal Study. No future need or demand scenarios associated with the Appraisal Study included Columbia Basin-level climate change modeling results (Addendum, pp. 111-113).

Purpose

The purpose of the Appraisal Study is to determine if there is at least one viable alternative, including and/or distinct from the LCEP concept itself, that warrants more detailed investigation through a RWSP Feasibility Study, and to recommend to Reclamation if such study should be initiated. The three core project objectives and screening criteria of the LCEP stakeholder group were to permanently resolve:

- LOID water quantity and quality problems
- ESA problems surrounding the LOP on the Nez Perce Indian Reservation

- Federal-Tribal Trust issues surrounding the LOP as a result of its predominant location on the Nez Perce Indian Reservation (Addendum, pages 1 and 12).

The project's objectives, purpose, and need are appropriately defined and found to be adequate within the LCEP stakeholder group's stated objectives. The LCEP stakeholder group's identified water shortage is a water-related conflict that has a nexus to a Reclamation project area. The alternatives suggested are viable enough to move to the Feasibility Study phase.

Alternative Evaluation

Reasonable Range

The Appraisal Study is based on the premise that alternative sources require discontinued use of all facilities upstream of the Reservoir A canal inlet and replacement with a 8,500 acre-feet capacity water supply system from a different source located on lands outside of the Nez Perce Reservation. Given these constraints, a reasonable range of structural alternatives has been formulated and evaluated as required under Rule § 404.44 [a]. Non-structural alternatives were not examined, as none were identified by the LCEP stakeholder group that met their stated objectives.

The Appraisal Study evaluates a reasonable range of alternatives to supply LOP water from sources downstream from the Reservoir A canal inlet, given the stated evaluation criteria. The available sources include pumping from the Clearwater and Snake Rivers, and a groundwater source utilizing pumping from wells.

At Least One Viable Alternative

The recommendation for further investigation of one or more alternatives is supported by the analysis in the Appraisal Study as required under Rule § 404.44 [b]. From an engineering standpoint, the sponsor met this Reclamation-wide appraisal study standard as outlined in Reclamation Manual, Design Data Collection Guidelines, Chapter 2 – Appraisal Investigations (Reclamation 2007). The Appraisal Study has identified several potential alternatives which could proceed to a Feasibility Study. These alternatives were developed by using existing data and information and preparing preliminary design and layout of features necessary to accomplish project objectives.

Water supply

For the western United States, the Appraisal Study area is relatively rich in water resources. However, other than the existing LOP's Craig Mountain source, no gravity source was identified or studied as adequate to meet the stated demand. Three sources of reused water with potential to partially or fully serve the stated

demand (treated wastewater effluent, industrial wastewater effluent, and stormwater) were identified as having high estimated capital costs in comparison to the selected alternatives, and some reusable water sources were not interested in participating in the LCEP process. Reclamation finds that under all alternatives, water rights may be obtained to meet objectives of the selected alternatives when pumped from either surface or groundwater sources located hundreds of feet below the service area elevation.

Environmental

While there are no obvious environmental "showstoppers" for the alternatives, a brief discussion of potential adverse effects, or lack thereof, is not provided in this Appraisal Study and would need to be addressed during Feasibility Study efforts.

Unresolved issues that may result in adverse environmental impacts are identified in the Appraisal Study (Addendum, page 69). Potential impacts are not addressed. Benefits to ESA listed steelhead are discussed throughout, however impacts to other listed species occurring in Nez Perce County (Spalding's catchfly, Canada lynx, wolverine, bull trout) are not analyzed to the same level.

The Appraisal Study acknowledges (Addendum, page 127) that Reclamation's Directives and Standards require a brief analysis of potential environmental, cultural and social impacts of the alternatives that affect potential for further investigation. However, only the environmental restoration benefits to Lapwai Creek are mentioned. There is no discussion of potential adverse affects of the alternatives.

Positive social impacts to only the Nez Perce Tribe are discussed. Potential adverse social effects to Tribal entities or potential positive or adverse social effects to non-Tribal entities are not addressed.

Design and costs

The project is technically viable from an engineering standpoint and from an engineering cost estimate standpoint. The six alternatives considered in the Appraisal Study involve pumping water from the Clearwater or Snake Rivers or from wells. These sources of water appear to be viable sources in the quantities identified in the Appraisal Study. Electric power providers in the vicinities of the pumping plants have been identified. Appraisal level design of the pumping plants and delivery pipelines have been prepared.

Reclamation did not perform an independent cost estimate but reviewed the sponsor's cost estimates for infrastructure only. Each alternative's estimate consists of costs for individual construction items, mobilization, sales tax, construction contingency, and non-contract items providing Project Total Costs as follows (costs obtained from Addendum Tables 4.7, 4.8, 4.9, 4.16, 4.17, and 4.24):

- Clearwater Reservoir A Discharge - $18,670,000
- Clearwater Reservoir A Discharge, Powers Avenue Upgrade - $21,262,000
- Clearwater Direct Discharge - $19,132,000
- Snake River Direct Discharge Southport - $17,011,000
- Snake River Direct Discharge Tammany - $23,095,000
- Tammany Well Field - $27,823,000

Reclamation's review of the cost estimates prepared for the Appraisal Study indicated that the infrastructure estimates appear to be low. The two primary areas that appear to account for a lower cost estimate are the omission of a Design Contingency and the estimated cost of the pumping plants.

The Design Contingency is a percentage cost multiplier intended to account for three types of uncertainties inherent as a project advances from the planning stage through final design, which directly affects the estimated cost of a project. These include: unlisted items, design and scope changes, and cost estimating refinements. For appraisal designs, Reclamation typically increases the subtotal of pay items by 15 % to account for the Design Contingency.

To evaluate the cost of the pumping plants, Reclamation utilized the Technical Service Center's PUMPLT cost estimating software, which provides an appraisal-level cost estimate of pumping plants with switchyards based on historical data. The software was used as a very rough order-of-magnitude check of the pumping plants cost. Based on the PUMPLT output, the pumping plant cost estimates are low by a factor of about 1.7 to 2.0.

In addition to the estimated cost of the pumping plants as calculated by the software, the capacity of the pumping plants may have to be increased slightly to account for pumping water to Reservoir A to replace water lost to evaporation and seepage. It appears the calculations for required pumping plant capacity do not include provisions to account for evaporation and seepage. This also translates into a slightly low estimate for the annual electric power cost.

The inclusion of the Design Contingency and a higher cost for the pumping plants in the Total Project Costs would increase the estimated costs of the alternatives by approximately 30 percent. Any final costs for water supplies would need to be further clarified at a feasibility level. The Appraisal Study seems to recognize the approximate nature of the estimates with the statement (Addendum, page 72), *"As defined by Association for the Advancement of Cost Engineering (AACE), Class 5 estimates, commonly associated with appraisal studies, are typically within -50% to +100% of final project cost. Costs presented herein should therefore be utilized with caution, as the project definition is not yet sufficient to yield a more accurate estimate."*

Using the above level of expected accuracy range for cost estimates, the estimates of water supply costs seem adequate for an appraisal level. Note that water supply costs are not part of any alternative proposed by the LCEP stakeholder group for Federal loan guarantees under the RWSP, as loan guarantees were not discussed.

Economic and Financial

The project appears to be economically and financially viable. Economic benefits to the study region are created primarily through construction investments and thus favor alternatives with higher capital costs. Restoration costs need to be further investigated beyond the existing placeholder value.

All alternatives resulted in projected total water costs well under the EPA threshold for LOID service area patrons. This indicates affordability of the project based on total water costs to LOID patrons, assuming 100 percent of calculated capital and OM&R costs for the project are assigned to LOID patrons over the planning period (Addendum, pages 119, 142). This is a conservative preliminary calculation which does not yet take into account the RWSP's cost share allowances.

Alternative Evaluation

Table 1 summarizes Reclamation's findings regarding the alternatives.

Table 1. Reclamation's findings regarding the alternatives

Evaluation criteria	Citation	Reclamation's findings
Has sufficient water supplies	Rule § 404.44 (c) (1)	Under all alternatives, water rights and supply currently exist or may be obtained without anticipated problems to fulfill the objectives of the alternatives as defined by the LCEP stakeholder group.
Has positive effect on health and safety	Rule § 404.44 (c) (2)	Under all alternatives, the types of health and safety impacts may change (i.e., increased temperature under the Tammany Well Field alternative but fewer surface water borne constituents), but the level of impacts on LOID patrons would appear to remain relatively unchanged by the alternatives.
Will meet water demand, including future needs	Rule § 404.44 (c) (3)	All alternatives fulfill the water demand as defined by the LCEP stakeholder group. Current and future water demands of the broader region are not addressed.
Provides environmental benefits	Rule § 404.44 (c) (4)	The environmental benefits of restoring streamflows and providing fish passage are indicated by the LCEP stakeholder group as occurring under all alternatives. Environmental benefits would be realized through restoration of the LOP system to a natural condition. These restoration needs are not fully articulated; therefore, the corresponding benefits are not fully articulated.
Provides source water protection	Rule § 404.44 (c) (4)	Any new water system under the alternatives would incur state regulatory control to enhance long-term protection of the water supply. All of Clearwater and Snake River alternatives, as conceptual

Evaluation criteria	Citation	Reclamation's findings
		water exchanges, would consolidate LOID's irrigation use on mainstem river flows and protect tributary water supplies.
Applies a regional or watershed perspective	Rule § 404.44 (c) (5)	The LOP and the LCEP stakeholder group interrelationship is indirectly addressed by the LCEP's stakeholder group's formation and completion of the Appraisal Study.
Promotes benefits in the region	Rule § 404.44 (c) (5)	LOID would gain a source of water with adequate capacity for stated needs under the action alternatives. The action alternatives would free up Lapwai Creek water for tributary instream flow increases to address the ESA and Trust Asset issues identified by the Nez Perce Tribe, and stop LOP operations on the Nez Perce Reservation to also address Indian Trust Asset issues. Direct benefits to the remaining stakeholders and broader region are not addressed, and there are elements in the action alternatives associated with the ESA and Indian Trust Assets which remain as unresolved issues. Economic benefits would be gained by the region due to construction.
Implements an integrated water resources management approach	Rule § 404.44 (c) (6)	The Appraisal Study developed and analyzed alternatives through the perspective of the LCEP stakeholder group's objectives.
Enhances water management flexibility	Rule § 404.44 (c) (7)	The availability of water coupled with the proposed delivery systems under all alternatives would enhance water management flexibility with respect to ESA issues. Losses associated with the existing system up to the Reservoir A inlet would be eliminated under all alternatives. Continued use of Reservoir A under all alternatives, and the limitations of the existing pipeline in the Reservoir A Discharge alternative, would not eliminate related operational challenges faced by LOID under the current system.
Provides for local control of water supplies and, where applicable, encouraging participation in water banking and markets	Rule § 404.44 (c) (7)	The Appraisal Study promotes the idea of a regionalized water market for Lapwai Creek water rights by stating that the existing water rights would be made available through the Idaho State Water Bank.
Promotes long-term protection of water supplies	Rule § 404.44 (c) (8)	This evaluation criterion involves several of the unresolved issues identified in the Appraisal Study (Addendum, pp. 69-71). It can be inferred from the Appraisal Study that the developed alternatives would eliminate Federal control of all existing LOP resources except potentially Reservoir A and would incur state regulatory control to enhance long-term protection of the water supply and possibly recreational facilities. Limiting users of the proposed alternatives to only LOID irrigation system patrons does not fully address regional development and associated long-term protection of water supplies, nor does it directly promote conservation.
Includes preliminary cost estimates that are	Rule § 404.44 (c) (9)	The Appraisal Study's preliminary cost estimates are supported by a reasonable development of appraisal level designs. The cost estimates are within an expected range of accuracy for appraisal level

Evaluation criteria	Citation	Reclamation's findings
reasonable and supported		investigations. Restoration costs need to be further investigated beyond the existing placeholder value. No estimate was provided for resolution of identified unresolved issues.
Is cost-effective and generates national net economic benefits (P&Gs)	Rule § 404.44 (c) (10)	Using the NED analysis, the Clearwater River Distribution System Discharge alternative was calculated to have the lowest present value of total costs (cost effectiveness) of the developed alternatives that met the LCEP stakeholder group's objectives.
Ability to pay 100% of OM&R	Rule § 404.44 (c) (11)	The Appraisal Study analyzed capability to pay based on the EPA threshold of 2.5 percent of median household income and an estimate of the LOID patron total water costs with a 100 percent share in the construction cost. All alternatives were determined to generate estimated water bills under the EPA threshold. This indicates affordability of the project without inclusion of calculation of capital cost share provided under the RWSP.

Other Appraisal Study Requirements

Reclamation finds that the LCEP stakeholder group adequately addressed the requirements under Rule §404.44 (c) that Reclamation deems appropriate and that are outlined in the FOA Section V.

If an application is made to receive assistance to conduct a Feasibility Study, the Application Review Committee will review these requirements. The sponsor statements (Addendum, pp. 146-150) are summarized in Table 2.

Table 2. Applicant's statements for other Appraisal Study Requirements

Administration program requirements	Applicant Statements
Minimize or reduce energy use	The shift from a gravity system to pumped systems would increase energy use under any alternative, but efforts have been made to diminish the ultimate impact of this change. High efficiency pump motors should be reviewed during the Feasibility Study to understand their potential impacts on cost and energy consumption.
Minimize or reduce water consumption	Replacement of the LOP canal system with any alternative would result in decreased water losses. In parallel to this planning effort, LOID has been using WaterSMART funds to implement a meter installation project that is expected to save almost 1,000 acre-feet annually. Education and enforcement during restricted periods are used by LOID as management tools.
Use renewable energy	Wind integration initiatives, which link projects with ability to store and use power with flexibility, such as the alternatives, are being explored with Bonneville Power Administration by the LCEP stakeholder group. In-line power generation options were examined but found to be cost-ineffective.
Provide environmental	This project provides for permanent resolution of ESA issues associated with the LOP..

Administration program requirements	Applicant Statements
benefits[1]	
Reduce impacts to critical habitat for Federally-listed threatened or endangered species	All alternatives would reduce LOP impacts and improve critical habitat for Snake River Basin Class B Steelhead in Sweetwater, Webb, and Lapwai Creeks.
Provides innovative technologies	Water reuse options were vetted and found to be cost ineffective, unavailable, or lacking in quantity. The alternatives are innovative because they promote a water exchange and mainstem river consolidation which would keep all parties out of court and meet all their needs.
Provides creative administrative or cooperative solutions.	The LCEP stakeholder group consists of governmental partners and their supporters seeking solutions to both rural water supply and tributary restoration issues.

Recommendations

As required under 43 C.F.R.§ 404.45 and Reclamation's Directive and Standards CMP TRMR-31, Reclamation has determined that it is appropriate to proceed to a Feasibility Study based on the criteria in Rule § 404.13 and Rule § 404.44.

Work may continue prior to formal initiation of a Feasibility Study. It may be beneficial to the group to begin to address outstanding unresolved issues to help focus the Feasibility Study and may lower overall study costs.

Pre-feasibility Study considerations may include the following:

- Cost share partners' determination of individual cost share needs and financial needs for the Feasibility Study and beyond. The LCEP acknowledges this in the November 15, 2011 meeting minutes (Addendum, Appendix A);

- Determination of which of the developed alternatives are to be carried forward for full analysis; and

- Commencement of preliminary title transfer discussions with all necessary parties.

The Feasibility Study, in addition to required elements, should consider the following specific elements:

Planning

- Inclusion of a value planning study early in the Feasibility Study process;
- Incorporation and cost estimation of the restoration piece of the project;
- Broader and/or narrower regional considerations during NEPA scoping efforts; and
- Additional conservation efforts, ongoing metering, education, and enforcement activities, to be explored in further detail.

Design

- Examination of multiple configurations of the basic components of the project, including previously examined on-demand systems;
- Inclusion of a value engineering study and provisions for Reclamation review and DEC Certification;
- Comprehensive evaluation of the long term viability of the integrity of Reservoir A as a storage facility;
- Detailed analysis of the evaporation and seepage losses from Reservoir A. Expected evaporation and seepage losses need to be included in the water balance calculations and pump capacity calculations;
- Collection of additional data, including river bathometry and analysis of river morphology to identify physically suitable location(s) for the pumping plants and fish screens, including evaluation of the potential for debris and sedimentation; and
- Investigations into locations for pipeline utility crossings.

Construction and OM&R cost estimates

- Inclusion of a percentage allowance for Design Contingencies to account for uncertainties as the project advances toward final design;
- Development of more detailed costs associated with the construction of pumping plants, including pumping costs to account for evaporation and seepage from Reservoir A;
- Further refinement of Non-Contract costs for design, surveying, geotechnical services, construction management, permits, and land/right of way acquisition;

- Provision of more detailed OM&R costs and assumptions for each alternative configuration; and

- Identification and resolution of risks and uncertainties for both OM&R and construction for all alternatives considered at the Feasibility stage.

Water Supply

- Additional conservation efforts, ongoing metering, education, and enforcement activities, to be explored in further detail;

- Acquisition of a new water supply at a feasibility level of detail, to include economic and social impacts of water transfer to all involved parties and detailed discussions with relevant Idaho Department of Water Resources (and Department of Environmental Quality, if necessary) staff; and

- Potential climate change impacts.

Environmental

- Development of a complete decision document, a combined planning Report/NEPA document which accurately represents the results of all planning efforts;

- Broader and/or narrower regional considerations during NEPA scoping efforts;

- Evaluation of both beneficial and adverse impacts of constructing and operating the alternatives, the roles of the potentially affected public, and transfer of title to any Federal facilities or lands that are part of LOP; and

- Consultation and Coordination with all stakeholders. In addition to the LCEP partners, all potentially affected publics including state, local, and Federal Agencies, Tribes, environmental organizations, sportsmen, and LOID patrons should be involved in the NEPA/Planning process as early as possible, due to their involvement in the unresolved issues identified by the LCEP stakeholder group.

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